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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of Kazunori SAEGUSA et al.

Serial No.: 10/030,105

Group Art Unit: 1711

Filed: May 14, 2002

Examiner: Jeffrey C. Mallis

P.T.O. Confirmation No.: 2106

For. **POROUS CERAMIC LAMINATE AND PRODUCTION THEREOF**

Attorney Docket No.: 820047

Customer No.: 98834

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Mr. Yasushi Nakanishi, do hereby declare as follows:

1. I am over the age of eighteen and am legally competent to affirm this declaration.
2. I am a citizen of Japan.
3. In March, 1992, I graduated with a Master's Degree from Osaka University, Faculty of Science, Department of Macromolecular Science.
4. Since April of 1992, I have been employed by Kaneka Corporation where I engage in research development for modifiers of plastics.
5. I have reviewed the materials consisting of U.S. Patent Application Serial No. 10/030,105 (hereinafter "the application") and am familiar therewith. I consider myself one skilled in the art in regard to the technology of this application.

6. By reproducing the experimental results of the application, I have confirmed that the reported particle sizes were measured by "volume average."

7. The volume average particle sizes of the graft polymers of the Examples and Comparative Examples are shown in the attached table. The number average particle sizes are shown for comparison.

8. In general, when there is a broadening of the particle size distribution, the difference between volume average particle size and number average tends to increase.

9. Although the particle size distribution of the particles of the application as set forth in the examples is rather sharp, a difference is detectable. Please see the attached table.

10. In regard to distinguishing weight average, in the case where the density of the particle is constant for every fraction, the values of volume average and weight coincide.

11. For polymerization systems such as the one set forth in the application, it can be assumed that the density of the individual particles is constant.

12. Hence, weight average particle size equals volume average particle size in the instance of this application by virtue of the following equation:

$$\sum \rho V_i d_i / \sum \rho V_i = \sum V_i d_i / \sum V_i$$

$$\rho V_i = W_i$$

V_i : volume % of fraction i
 W_i : weight % of fraction i
 d_i : particle size of fraction i
 ρ : density of the particle¹

13. Wherefore, it is my opinion that the subject matter as described in the specification is described in such a way as to reasonably convey to one skilled in the art that the inventors at the

¹ See attached excerpt of Micronac® Ultrafine Particle Analyzed Operator's Manual.

time the application was filed had possession of the claimed invention. Namely, one skilled in the art is able to ascertain by routine experimentation that the "particle sizer" of the application refer to "volume average particle size."

The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this 10th day of February, 2004

S. Nakanishi
Yasushi Nakanishi
Title: Chemist
KANEKA CORPORATION

Table: Results of particle size measurement with Microtrac UPA.

Tables in Specification	Graft Copolymer	Page of Specification	Volume average particle size (μm) m_v	Number average particle size (μm) m_n
Table 1	G-1	Pg. 35	0.24	0.23
	G-2	Pg. 36	0.09	0.09
	G-3	Pg. 40	0.37	0.35
	G-4	Pg. 42	0.09	0.07
Table 2	G-5	Pg. 43	0.27	0.26
	G-6	Pg. 45	0.08	0.07
	G-7	Pg. 50	0.18	0.17
Table 3	G-8	Pg. 51	0.27	0.27
	G-9	Pg. 52	0.08	0.08
	G-10	Pg. 54	0.26	0.25
	G-11	Pg. 55	0.07	0.06
	G-12	Pg. 58	0.24	0.22
	G-13	Pg. 59	0.25	0.24
	G-14	Pg. 59	0.10	0.10

Microtrac® Ultrafine Particle Analyzer

Operator's Manual
179554 Rev. B

Leeds+Northrup
A UNIT OF GENERAL SIGNAL



The purpose of this manual is to provide complete and accurate information to meet your operating and/or service requirements for Leeds and Northrup equipment. Your comments and suggestions are welcome.

Leeds and Northrup
351 Sunnyside Pike
North Wales, PA 19454

Attention: Technical Publications

CAUTION: *This equipment contains devices that can be damaged by electrostatic discharge. It is imperative that assemblies containing static-sensitive devices be carried in conductive plastic bags. Grounded work stations and wrist straps must be used when adjusting or performing any work on such assemblies. If soldering irons are used, they must also be grounded.*

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RUN DISPLAY - Microtrac ULTRAFINE PARTICLE ANALYZER -		Version 5.00																																																																																																																																																																																																																																																																																																																																																																																
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<tr><td>3.5663</td><td>100.00</td><td>0.00</td><td>0.3301</td><td>100.00</td><td>0.00</td><td>0.0788</td><td>79.12</td><td>2.64</td><td>0.0117</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>3.2763</td><td>100.00</td><td>0.00</td><td>0.4861</td><td>100.00</td><td>0.00</td><td>0.0723</td><td>78.28</td><td>4.08</td><td>0.0107</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>2.9989</td><td>100.00</td><td>0.00</td><td>0.4458</td><td>100.00</td><td>0.00</td><td>0.0663</td><td>82.22</td><td>5.53</td><td>0.0099</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>2.7600</td><td>100.00</td><td>0.00</td><td>0.4088</td><td>100.00</td><td>0.00</td><td>0.0608</td><td>76.69</td><td>7.24</td><td>0.0090</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>2.5217</td><td>100.00</td><td>0.00</td><td>0.3749</td><td>99.73</td><td>0.40</td><td>0.0557</td><td>49.48</td><td>8.74</td><td>0.0083</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>2.3115</td><td>100.00</td><td>0.00</td><td>0.3437</td><td>99.33</td><td>0.44</td><td>0.0511</td><td>60.71</td><td>10.01</td><td>0.0076</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>2.1205</td><td>100.00</td><td>0.00</td><td>0.3152</td><td>98.49</td><td>0.48</td><td>0.0469</td><td>60.70</td><td>10.85</td><td>0.0070</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>1.9465</td><td>100.00</td><td>0.00</td><td>0.2891</td><td>98.41</td><td>0.50</td><td>0.0430</td><td>40.18</td><td>10.33</td><td>0.0064</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>1.7821</td><td>100.00</td><td>0.00</td><td>0.2651</td><td>97.81</td><td>0.53</td><td>0.0396</td><td>29.83</td><td>9.88</td><td>0.0059</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>1.6352</td><td>100.00</td><td>0.00</td><td>0.2431</td><td>97.41</td><td>0.48</td><td>0.0361</td><td>30.25</td><td>8.38</td><td>0.0054</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>1.4984</td><td>100.00</td><td>0.00</td><td>0.2229</td><td>96.95</td><td>0.43</td><td>0.0331</td><td>11.87</td><td>6.39</td><td>0.0049</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>1.3750</td><td>100.00</td><td>0.00</td><td>0.2044</td><td>96.82</td><td>0.38</td><td>0.0304</td><td>5.48</td><td>3.72</td><td>0.0045</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> 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2.9989	100.00	0.00	0.4458	100.00	0.00	0.0663	82.22	5.53	0.0099	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
2.7600	100.00	0.00	0.4088	100.00	0.00	0.0608	76.69	7.24	0.0090	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
2.5217	100.00	0.00	0.3749	99.73	0.40	0.0557	49.48	8.74	0.0083	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
2.3115	100.00	0.00	0.3437	99.33	0.44	0.0511	60.71	10.01	0.0076	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
2.1205	100.00	0.00	0.3152	98.49	0.48	0.0469	60.70	10.85	0.0070	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.9465	100.00	0.00	0.2891	98.41	0.50	0.0430	40.18	10.33	0.0064	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.7821	100.00	0.00	0.2651	97.81	0.53	0.0396	29.83	9.88	0.0059	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.6352	100.00	0.00	0.2431	97.41	0.48	0.0361	30.25	8.38	0.0054	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.4984	100.00	0.00	0.2229	96.95	0.43	0.0331	11.87	6.39	0.0049	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.3750	100.00	0.00	0.2044	96.82	0.38	0.0304	5.48	3.72	0.0045	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.2609	100.00	0.00	0.1874	96.14	0.35	0.0279	1.76	1.76	0.0041	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.1552	100.00	0.00	0.1719	95.79	0.33	0.0255	0.00	0.00	0.0039	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
1.0403	100.00	0.00	0.1576	95.46	0.32	0.0234	0.00	0.00	0.0035	0.00	0.00	0.00	0.00	0.00	0.00																																																																																																																																																																																																																																																																																																																																																																			
F1 - 4retn F2 - warning F3 - histogram F4 - Summary *F4 - peaks Esc - exit																																																																																																																																																																																																																																																																																																																																																																																		

1 - Title Section:

This area contains the following information:

- Type of display (Run)
- Type of analyzer bench (UPA)
- Software version

2 - Header Section:

This area contains a user entered custom header accessed through the Primary Keypad - Sample Desc key

3 - Summary Data:

ci - Concentration Index provides an approximate indication of particle concentration. It is derived from the scattered optical signal and the optical parameters entered by the operator (fluid and particle refractive indices, "Transparent Particle (yes/no)", "Spherical Particles (yes/no)").

10%, 50%, 90% - Percentile Points (microns) show the given percent of the volume (or weight, if the specific gravity for all the particles is the same; generally a good assumption) that is smaller than the indicated size. The 50% is also known as the median diameter which is one of several measures of "average particle size".

mv - Mean Diameter (microns) of the Volume distribution represents the center of gravity of the distribution. Implementation of the equation used to calculate MV will show it to be a value weighted by coarse particles. It is another type "average particle size."

$$mv = \frac{\sum V d_i^4}{\sum V d_i^3}$$

Where:

Σ = "sum of"

V = volume percent in a channel size

d = channel diameter in microns

mn - Mean Number Diameter (microns) is the mean particle diameter calculated from the number versus diameter distribution (number frequency distribution).

$$mn = \frac{\sum \frac{V_i^2}{d_i^3}}{\sum \frac{V_i}{d_i^3}}$$

Where:

Σ = "sum of"

V = volume percent in a channel size

d = channel diameter in microns

cs - Calculated Specific Surface Area (M^2/cm) provides an indication of specific surface area. Since the CS computation assumes solid, spherical particles, it should not be interchanged with BET or other adsorption methods of surface area determination since CS does not reflect porosity or unique topographic characteristics of particles.

ma - Mean Diameter (microns) of the Area distribution is calculated according to the equation below. Area means are another type of "average" which are less weighted by the presence of coarse particles than mv and therefore show smaller particle size.

$$m_d = \frac{\sum V_i}{\sum \left(\frac{V_i}{d_i} \right)}$$

Where:

Σ = "sum of"

V = volume percent in a channel size

d = channel diameter in microns

mi = mi used in place of m_d when in intensity mode

sd - Standard Deviation (microns) describes the width of the measured particle size distribution. It does not provide an indication of the statistical error about the mean of multiple measurements.

$$sd = \frac{(84\% - 16\%)}{2}$$

mw - Molecular Weight (gm/mole) of the particles as calculated from the following formula:

$$mw = \rho N_A \left(\frac{\pi}{6} \right) d_m^3$$

Where:

ρ = particle density

N_A = Avogadro's Number

d_m = median diameter in centimeters

4 - Run Information:

This section is located on both sides of the Summary Data and contains a description of all the parameters associated with the current sample analysis.

5 - Tabular Data:

The measuring range is divided into fixed "channel" or particle sizes. Channel sizes are identified on the left column in units of microns. Cumulative data values are on the same line as the channel size, and are read "percent smaller than (larger than) the selected channel" for percent passing (retained) format. Volume or percent in channel data (%-ch) are read as "volume percent between the channel size on the same line and the line below". For percent retained, the data are read from the same line and the line above.